

REMARKS/ARGUMENTS

Claims 1-16 and 29-35 remain in this application. Claims 1-6, 8-12 and 14 have been amended. Claims 17-28 have been cancelled by a previous amendment. Claim 35 is new. Claims 15, 16 and 29-34 have been withdrawn as a result of the restriction requirement. In view of the examiner's earlier restriction requirement, applicant retains the right to present claims 15, 16 and 29-34 in a divisional application.

Restriction Requirement

The Examiner issued a Restriction Requirement identifying the following groups of claims as being drawn to potentially distinct inventions:

- Group I. Claims 1 - 14, drawn to the dispersion compensating fiber, classified in class 359, subclass 337.5;
- Group II. Claims 15 - 28, drawn to method of operating a transmitter and receiver system with a DCF, classified in class 398, subclass 148; and
- Group III. Claims 29 - 34, drawn to the Raman amplifier, classified in class 359, subclass 334.

The Examiner asserted that the inventions of Groups I and II and the inventions of Groups III and II may be regarded as independent and distinct from one another because the method could be practiced on an apparatus employing time division reflectometry. The Examiner also asserted that the inventions of Groups I and III are subcombinations and that invention III has separate utility as a Raman Medical laser.

In a telephone conference with the undersigned attorney/agent of record dated 9/13/05 a provisional election to Group I, claims 1-14 was made, without traverse. Applicants hereby confirm that provisional election, with/without traverse, subject to Applicant's right to file a divisional application.

Claims Rejections

Claims 1-14 stand rejected under 35 USC 112, second paragraph because of the use of the terms “about” and “substantially different”, which according to the Examiner rendered these claims indefinite.

Accordingly independent claim 1 and its dependent claims 3-6, 8-12 and 14 have been amended to remove the ubiquties pointed out by the Examiner. Claim 2 has also been amended to make it more definite.

Claims 1-6 and 9 stand rejected under 35 USC 102(b) as being anticipated by Miyakawa et al. (USPP No 2001/0021291).

Paragraph [0081] of the Miyakawa reference discloses a dispersion compensating fiber 22 with dispersion value of -85ps/nm/km. Applicants amended independent claim 1 to specify that the dispersion compensating device includes “a dispersion compensating fiber having a dispersion more negative than -100 ps/nm/km”.

This amendment is supported by Table 1 (see pg 9) of the Applicants specification. Claims 3-6 and 9 depend from the independent claim 1 as their base claim and therefore explicitly incorporate the language of claim 1.

Accordingly, the Miyakawa reference no longer anticipates claim 1, 3-6 and 9.

Claim 2 has been rewritten in independent form and incorporates the subject matter of the original claim 1. Claim 2 calls for “Raman gain fiber has a Raman Figure of Merit of at least 10 W^{-1} at the pump wavelength”. The Miyakawa reference does not disclose such fiber. More specifically, the Miyakawa reference discloses at Figure of Merit (FOM) of about 5.7 or about half that claimed by the Applicants. The calculation of maximum FOM achieved by the Miyakawa is provided for Examiner’s verification, as follows:

FOM=Gain/(Aeff x Attenuation/km), where Aeff is the effective area of the fiber and Attenuation is fiber’s attenuation (or Loss).

Figure 2 of the Miyakawa reference shows that the maximum value of Raman Gain minus Fiber loss is 3 dB, which occur at the A_{eff} of $55 \mu m^2$. Thus, Gain is Attenuation + 3 dB. Accordingly for the value of Gain in the above equation we can use (Attenuation + 3 dB).

Figure 8 of the Miyakawa reference shows that the minimum length of Raman Fiber is 100 km and paragraph [0081] discloses that the fiber attenuation per km is 0.21dB/km. Thus minimum value for fiber attenuation in this reference is $100km \times 0.21dB/km = 21$ dB. This corresponds to the FOM value of $(21+3)/(55 \times 0.21) = 2.08$. Figure 8 of the Miyakawa reference also shows that the maximum length of Raman Fiber is 300 km. Thus maximum value for fiber attenuation in this reference is $300km \times 0.21dB/km = 63$ dB. This corresponds to the FOM value of $(63+3)/(55 \times 0.21) = 66/11.5 = 5.71$. **Therefore, maximum FOM value is $(63+3)/(55 \times 0.21) = 5.71$.** This is much smaller than the FOM value claimed by the Applicants in claim 2.

Applicants Claim 3 also specifies that “the Raman gain fiber has a dispersion at the pump wavelength having an absolute value between 15 ps/nm/km and 25 ps/nm/km”. The Examiner stated that “Miyakawa discloses a Raman fiber with $D=19ps/nm/km$ ”. However, the Examiner misread the reference. The disclosed dispersion of the Raman gain fiber is $-2ps/nm/km$ (see Paragraph [081]), thus its absolute value is $2ps/nm/km$. This value is outside of the range claimed by the Applicants in claim 3. The dispersion value of $19ps/nm/km$ quoted by the Examiner corresponds to the single mode transmission fiber 12a, not the Raman fiber 12b.

Regarding Claim 6, the Examiner stated “Fiber 12a where most of the Raman application occurs has a mode field diameter of $10\mu m$.” However, Applicants claimed the core diameter between $3.6\mu m$ and $4.8 \mu m$, not the $10 \mu m$. That is, Applicants’ claimed core diameters are much smaller than that of pointed out by the Examiner, therefore claim 6 is not anticipated by this reference. Furthermore, most of the Raman amplification occurs in fiber 12b of the Miyakawa, not fiber 12a (See Fig. 1). Although paragraph [0034] of this

reference discloses that fiber 12b has a MFD of 8.6 μm , this MFD is still outside the range claimed by the applicants.

Claim 7 stands rejected under 35 USC 103(a) as being unpatentable over Miyakawa et al as applied to claims 1-6 and 9, above.

However, claim 7 depends from the independent claim 1 as their base claim and therefore explicitly incorporates the language of claim 1. Accordingly, claim 7 is not unpatentable over the Miyakawa reference. Furthermore, claim 7 specifies that the “dispersion compensating fiber has a dispersion slope more negative than $-1.5 \text{ ps/nm}^2/\text{km}$ at 1575 nm”. None of the cited references provide an incentive or suggestion of modifying Miyakawa reference to include such dispersion compensating fiber. Absent such suggestion or remark, in the cited references themselves, Applicants’ claim 7 is not unpatentable.

Claim 8 and 14 stand rejected under 35 USC 103(a) as being unpatentable over Miyakawa et al as applied to claims 1-6 and 9, above.

Claims 8 and 14 depend from the independent claim 1 as their base claim and therefore explicitly incorporate the language of claim 1. Accordingly, claims 8 and 14 are not unpatentable over the Miyakawa reference.

Claim Objections-claims 8 stand objected to because claims 8 and 14 were identical

Claim 14 has been amended to depend from claim 2. Accordingly, claims 8 and 14 are no longer identical.

New claim 35

Claim 35 is new. It depends from the independent claim 1 and its subject matter is supported by paragraph [0009] of the Applicant's specification.

Conclusion

Applicants believe that no extension of time is necessary to make this Response timely. Should Applicants be in error, Applicants respectfully request the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Response timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Svetlana Z. Short at 607-974-0412.

Respectfully submitted,

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